Master of Technology in Software Engineering

Shortcut

Overview

Next Intake	Aug 2023 (Full-Time), Jan 2024 (Part-Time)
Duration	• Full-time 1 year (2 semesters) • Part-time 2 years (4 semesters)
Application Timeline	Admissions into the MTech programme is competitive. Eligible students will be offered admissions on a first-come first-served basis, The average application processing period would take between 6 - 8 weeks. Applications for August 2023 admission into the full-time MTech SE should be submitted before 30 April 2023. Applications for January 2024 admissions into the part-time MTech SE should be submitted before 15 October 2023. **Applicants based in Singapore are to take the test in NUS-ISS. Applicants based overseas can take the test online. If you apply after the above dates and are accepted into the programme, you will be offered advanced admission into the following academic year (August 2024/January 2025). The dates above are subjected to changes.*
Entrance Test	Online: 16 March, 22 March, 31 March, 12 April and 20 April 2023 Face-to-Face: 22 March, 12 April and 20 April 2023* **Applicants based in Singapore are to take the test in NUS-ISS. Applicants based overseas can take the test online.* *The dates above are subjected to changes.*
Download Brochure	English
Info-session Group discussion	Click here for dates
Enquiry	iss-admissions@nus.edu.sg

The NUS Master of Technology in Software Engineering (MTech SE) is designed to meet the industry demand for software engineers who can help Singapore organisations to realise the smart nation initiatives through building robust, reliable and scalable software systems. This programme is best suited for individuals who have a few years of experience in software engineering roles and are looking to further enhance their knowledge and skills in architecting scalable, secure and smart software systems.

The MTech SE programme emphasises the skills required for architecting scalable, secure and smart systems and platforms. The focus will also be exploitation of software technologies, methodologies and management techniques. It focuses on the practical and systematic construction of software systems, using innovative and state-of-the-art techniques..

The programme will equip you with the essential knowledge and practical experience to architect, design, build and manage the delivery of robust software systems for your organisation and customers.

Learning outcomes:

- Become software architects capable of architecting and designing systems that exploit major contemporary software platforms, technologies and methodologies
- Become software architects capable of architecting and designing smart and secure systems
- Become data architects equipped with data engineering skills to engineer big data from a variety of sources

Recognition:

- Top student is awarded the Accenture Medal and Prize
- Top project team is awarded the Best Project Prize

Scholarship:

- **IMDA Post Graduate Scholarship:** The SG:D Scholarship (Postgraduate) is an industry scholarship that empowers students pursuing postgraduate studies in specialised ICM areas such as Artificial Intelligence, Cybersecurity, Analytics, Immersive Media, and Digital Content Creation. Scholarship details and eligibility criteria can be found here.

Modules

MTech SE candidates must successfully complete the following course components to be awarded the degree:

- **Fundamental** - Complete 2 Graduate Certificates
- **Specialist -** Complete 2 of 4 Graduate Certificates

Fundamental Software Engineering Areas

Designing Modern Software Solutions

Members of agile teams will learn how to apply essential agile practices, software design skills and DevSecOps practices to analyse, design and implement nontrivial software systems that are robust, reusable, maintainable and extensible with the relevant project artifacts.

Courses:

- Essential Practices for Agile Teams
- Software Analysis & Design
- Software Design Patterns
- DevSecOps Engineering and Automation

Architecting Scalable Systems

Students will learn how to architect scalable, robust and reliable ubiquitous systems using the latest Cloud-based technology. Students will also focus on how to architect the back-end support for large

systems and platforms. **Courses:**

- Architecting Software Solutions
- Platform Engineering
- Cloud Native Solution Design

Specialist Software Engineering Areas

Architecting Smart Systems

Students will learn skills and techniques required to engineer end-to-end Intelligent Smart Systems. Topics in architecting smart IoT platforms and systems that are scalable will be covered. Students will learn to design, develop and integrate systems that make sense of data from a variety of sensors and edge devices. Students will also learn to create interfaces to smart systems that are apt for interacting with humans in intelligent manners. **Courses:**

- Architecting IoT Solutions
- Designing Intelligent Edge Computing
- Humanizing Smart Systems

Designing and Managing Products and Platforms

Students will learn how to design and manage software products and platforms. The key components include using design thinking principles and market research to innovate and concretise product ideas; a framework to scaffold the multidisciplinary aspects of managing a product; develop a product strategy that aligns with business goals and to architect a platform business model from first principles. Students can expect a hands-on approach, engaging class dialogues, lectures and offline study. Valuable insights will be shared by industry practitioners. **Courses:**

- Service Design
- Managing Digital Products
- Digital Product Strategy
- Architecting Platforms as a Business

Engineering Big Data

Students will learn various aspects of data engineering and processes required for building resilient distributed datasets. Students will also learn to apply key practices, identify multiple data sources appraised against their business value, design the right data storage model(s), and implement fitting data access patterns. Finally, students will build a scalable data pipeline composed of pluggable functional compute components based on the business insight requirements in a vendor/technology agnostic manner. Students will work with Spark and Hadoop framework along with detailed focus on graph, ML, query and streaming libraries. **Courses:**

- Information Architecture for Data-driven Insights
- Big Data Engineering for Analytics
- Architecting Systems for Real-Time data processing

Securing Ubiquitous Systems

Students will be equipped with skills to design and manage cyber security for ubiquitous systems that need to be highly secure. Students will learn about cyber security and its application in securing mobile systems and software platforms. Students will also learn how to incorporate security during the software development lifecycle. **Courses:**

- (ISC)^2 CISSP CBK Training Seminar
- Secure Software Development Lifecycle for Agile
- Design Secure Mobile Architecture
- Platform Security

Learning Journey

Designing Modern Software Systems	Architecting Scalable Systems	Architecting Smart Systems	Designing an Managing Produ and Platform
Essential Practices for Agile Teams	Architecting Software Solutions	Architecting IoT Solutions	Service Design
Software Analysis & Design	Platform Engineering	Designing Intelligent Edge Computing	Managing Digital Products
Software Design Patterns	Cloud Native Solution Design	Humanizing Smart Systems	Digital Product Strategy
DevSecOps Engineering and Automation			Architecting Platforms as a Business

Graduate Certificate in Designing Modern Software Systems

Graduate Certificate in Architecting Scalable Systems

Graduate Certificate in Architecting Smart Systems

Graduate Certificate in Designing and Managing Products and Platforms

Capstone Project & Internships

A central element of the MTech programme is the project module.

Student projects for MTech SE students extend over a period of 5 months for full-time students and 7 months for part-time students. Students are required to conduct their projects in teams. The expected commitment for the project is 45 man-days per team member.

Objectives

- Architect, design and develop a real-world software system
- Demonstrate technical and management skills by documenting various aspects of the system development and on-time delivery of quality systems.
- Deliver a fully-tested system that fulfils the requirements of the sponsoring company

Learning outcomes:

- Manage a software development project following a formal approach
- Engineer software systems using appropriate software engineering methods and construction technologies
- Apply project and quality management techniques to deliver a robust solution that meets user requirements

Read more on Internship & Placements

Timetable & Exams

Timetable & Exams for Full-time Students

New curriculum w.e.f January 2023 intake

Year	Curriculum	Assessment

<table>
<tr><td>Year 1 Semester 1 (Jul - Nov)</td><td colspan="2">SWE5006: Designing Modern Software Systems (compulsory)

• Essential Practices for Agile Teams
• Software Analysis & Design
• Software Design Patterns
• DevSecOps Engineering and Automation

SWE5001: Architecting Scalable Systems (compulsory)

• Architecting Software Solutions
• Platform Engineering
• Cloud Native Solution Design</td><td>• Continuous assessments
• Open book written exams (not applicable to SWE5006)</td></tr>
<tr><td rowspan="2"></td><td colspan="2">Choose ONE</td><td rowspan="2">• Continuous assessments
• Open book written exams (not applicable to SWE5002)</td></tr>
<tr><td>SWE5002: Designing and Managing Products and Platforms

• Service Design
• Managing Digital Products
• Digital Product Strategy
• Architecting Platforms as a Business</td><td>SWE5005: Securing Ubiquitous Systems

• (ISC)² CISSP CBK Training Seminar
• Secure Software Development Lifecycle for Agile
• Design Secure Mobile Architecture
• Platform Security</td></tr>
<tr><td>Year 1 Semester 2 (Jan - Mar)</td><td colspan="2">Choose ONE</td><td rowspan="2">• Continuous assessments
• Open book written exams</td></tr>
<tr><td>SWE5003: Engineering Big Data

• Information Architecture for Data-driven Insights
• Big Data Engineering for Analytics
• Architecting Systems for Real-Time Data Processing</td><td>SWE5004: Architecting Smart Systems

• Architecting IoT Solutions
• Designing Intelligent Edge Computing
• Humanising Smart Systems</td></tr>
<tr><td>Year 1 Semester 2 (Mar - Jul/Aug)</td><td colspan="2">Team-based Internship

Hands-on project with external organisation</td><td>• Project, presentation & report</td></tr>
</table>

Timetable & Exams for Part-time Students

New curriculum w.e.f January 2023 intake

Year	Curriculum	Assessment

<table>
<tr><td>Year 1
Semester 1
(Jan - May)</td><td colspan="2">SWE5006: Designing Modern Software Systems (compulsory)

• Essential Practices for Agile Teams
• Software Analysis and Design
• Software Design Patterns
• DevSecOps Engineering and Automation</td><td>• Continuous assessments</td></tr>
<tr><td>Year 1
Semester 2 (Jul - Nov)</td><td colspan="2">SWE5001: Architecting Scalable Systems (compulsory)

• Architecting Software Solutions
• Platform Engineering
• Cloud Native Solution Design</td><td>• Continuous assessments
• Open book written exams</td></tr>
<tr><td rowspan="2">Year 2
Semester 1
(Jan - May)</td><td colspan="2">Choose ONE</td><td rowspan="2">• Continuous assessments
• Open book written exams (not applicable to SWE5002)</td></tr>
<tr><td>SWE5002: Designing and Managing Products and Platforms

• Service Design
• Managing Digital Products
• Digital Product Strategy
• Architecting Platforms as a Business</td><td>SWE5005: Securing Ubiquitous Systems

• (ISC)² CISSP CBK Training Seminar
• Secure Software Development Lifecycle for Agile
• Design Secure Mobile Architecture
• Platform Security</td></tr>
<tr><td rowspan="2">Year 2
Semester 2 (Jul - Nov)</td><td colspan="2">Choose ONE</td><td rowspan="2">• Continuous assessments
• Open book written exams</td></tr>
<tr><td>SWE5003: Engineering Big Data

• Information Architecture for Data-driven Insights
• Big Data Engineering for Analytics
• Architecting Systems for Real-Time Data Processing</td><td>SWE5004: Architecting Smart Systems

• Architecting IoT Solutions
• Designing Intelligent Edge Computing
• Humanising Smart Systems</td></tr>
<tr><td>Year 2
Semester 1-2
(Mar - Sep)</td><td colspan="2">Team-based Off-site Project

Hands-on project with external organisation</td><td>• Project, presentation & report</td></tr>
</table>

Students are evaluated through a combination of course work, project work and examinations. All students are required to complete a three-hour examination, where applicable, for each fundamental and specialist module taken.

Students who fail a module will be asked to withdraw. A minimum average grade across all examinations and practice assessments must be achieved to be awarded the degree.

Fees

From 1 January 2023

A new foundation graduate certificate titled *Designing Modern Software Systems* is introduced to equip the students with skills on agile practices, software design and DevSecOps. The original DevOps course is removed from the fundamental graduate certificate titled *Architecting Scalable Systems*. The new fee structure reflects the addition of 10 days of classroom learning and a practice module.

Fee Component	International Students	Singaporeans aged 21 years and above	Singaporeans aged 40 years and above	Singapore Permanent Residents
Full Tuition Fees	S$52,900 to S$53,390	S$50,065 to S$52,900	S$49,115 to S$52,900	S$50,065 to S$52,900
NUS-ISS Subsidy	-	S$8,568.00 to S$9,420.00	S$8,568.00 to S$9,420.00	S$8,568.00 to S$9,420.00
Nett Tuition Fees	S$52,900 to S$53,390	S$41,497.00 to S$43,480.00	S$40,547.00 to S$43,480.00	S$41,497.00 to S$43,480.00
8% GST on Nett Tuition Fees	S$4,232.00 to S$4,271.20	S$3,478.40 to S$3,319.76	S$3,478.40 to S$3,319.76	S$3,478.40 to S$3,319.76
Total Nett Tuition Fees, including GST	S$57,132.00 to S$57,661.20	S$44,816.76 to S$46,958.40	S$43,866.76 to S$46,958.40	S$44,816.76 to S$46,958.40
NUS-ISS Study Award for AY2022/AY2023 (See T&Cs on Study Award below)	-	Up to S$20,000	Up to S$20,000.00	Up to S$10,000.00
Total Nett Tuition Fees payable after Study Award, including GST	S$57,132.00 to S$57,661.20	S$26,596.12 to S$26,958.40	S$25,646.12 to S$26,958.40	S$35,706.44 to S$36,958.40

Note:

1. The current NUS-ISS Subsidy is a subsidy of 20% of the component course fees. The NUS-ISS Subsidy is subjected to change without prior notice. There is no subsidy for the Practice Module fees or the Capstone fees.
2. The exact tuition fees will be calculated based on the student's selection of the Graduate Certificates
3. Miscellaneous fees of S$250.38 per semester apply (For Full-Time Students).
4. Miscellaneous fees of S$132.68 per semester apply (For Part-Time Students).
5. From 1 January 2023, GST will be increased to 8%.
6. From 1 January 2024, GST will be increased to 9%.

Terms & Conditions of the NUS-ISS MTech Study Award (as of 15 March 2023):

1. The NUS-ISS MTech Study Award will be given to qualifying Singaporeans and Singapore Permanent Residents matriculated in AY2023/2024 and AY2024/2025 into the unfunded MTech EBAC, MTech IS and MTech SE degrees as through-train students.
2. The NUS-ISS MTech Study Award may be amended at any time at the discretion of NUS-ISS.
3. The quantum of the Study Award will be (up to) S$20,000 for Singaporeans, subject to the T&Cs described here.
4. The quantum of the Study Award will be (up to) S$10,000 for Singapore Permanent Residents, subject to the T&Cs described here.
5. The Study Awards will be divided evenly and given out progressively over the semesters of study, i.e., for part-time students, the award will be given out over four semesters, and for full-time students, the award will be given out over two semesters. The semesters must run consecutively unless approved by NUS-ISS.
6. Within each semester, the Study Award may not exceed the fees paid by the respective student in that semester.
7. Students who are entitled to course module waivers will still receive the waiver, and need not pay course fees for those course modules.
8. The Study Award will be on top of and applied after any other subsidies in course module fees.
9. Where students have been waived fees at the start of the programme, the Study Award will be pro-rated as a simple proportion of the remaining fees.
    1. For the pro-ration calculation, we will use the maximum fees payable for the respective programme, before GST and misc fees.
    2. For example,
        1. the maximum fees for a SE student is $53,390
        2. Say that student has taken two 3-day component courses which are allowed as waivers, totalling $5,400 in waived fees
        3. The remainder of the fees is now $53,390 - $5400 = $47,990
        4. The Study Award will be prorated as $20,000 x (47,990/53,390) = $17,977.15
10. Students need not choose to apply, or to accept the Study Award. The Study Award will be given automatically to all entitled students when they are matriculated into the respective MTech programme.
11. Students may choose to decline the Study Award, in which case, they should inform NUS-ISS when they accept entry into the programme.
12. Students who are already in receipt of full scholarships or sponsorship support are not eligible for the Study Awards. Those who are in receipt of partial scholarship/sponsorship shall have proportionally reduced study awards.
13. Students who withdraw from the programme or are terminated from the programme before graduation will not be eligible for the Study Award in future.
14. The Study Award may be terminated at any time if, in the opinion of NUS-ISS, the scholarship holder's progress or behaviour is deemed unsatisfactory.

Admission & Application

Applicants must possess the following prerequisites:

1. Bachelor's degree preferably in Science or Engineering and a grade point average of at least B
2. Proficiency in the English Language (written and spoken)*
3. Preferably two years relevant working experience as a software engineer (e.g. programmer, designer, technical team lead).
4. Preferable proficiency in the following areas:
    - Software development lifecycle, including Agile software development methods such as Scrum.
    - Software development using one or more contemporary programming languages, software design including the use of design patterns, software testing and test-driven development.
5. Have passed an entrance test

- NUS-ISS may, at its discretion, accept **GRE general test** in lieu of NUS-ISS entrance test in genuine cases e.g. a candidate lives in a country where NUS-ISS does not administer entrance tests or candidate had valid reasons that prevented him/her from attending the NUS-ISS entrance test when it was administered
- A sample of the entrance test can be found **here**

6. Have received a favourable assessment at admissions interview conducted by NUS-ISS ***English Language Proficiency***
   - *Applicants who graduated from universities where English is not the medium of instruction should submit TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing System) score as evidence of their proficiency in the English language.*

TOEFL	*Paper-based test (580) Computer-based test (237) Internet-based test (85)*
IELTS	*Result of 6.0*

- *Institution code of NUS-ISS for TOEFL is 2432*
- *TOEFL and IELTS are only valid for five years after the test and the validity should not expire before the beginning of the application period for the coursework programme.*
- *NUS-ISS accepts TOEFL iBT Special Home Edition test scores.*

How to Apply

All applicants are required to submit an online application for our graduate coursework programme (through-train).

Step 1: You can refer to our detailed **step-by-step guide** on how to complete the online application.

Step 2: It will take you about 30 minutes or more to complete your application. You will need the softcopies of the supporting documents for your online application. Click **here** for the supporting documents to be uploaded and additional information required.

Step 3: You can proceed to **apply online**. Remember to **upload all the required supporting documents** under the "**Documents Upload**" section **before** you do the online submission. You can refer to our **FAQ**.

Step 4: Please ensure you **submit** your online application(s) and make **online payment** for the application fee (non-refundable) of **S$50.00** per application (*inclusive of prevailing GST*).

Important:

1. *Applications that are **incomplete**, including missing supporting document(s), **will not be processed**.*
2. *Applicants who are found to have given inaccurate or false information will be required to withdraw from the programme.*
3. *All payments for application fee are **non-refundable.***
4. *Please note that the University has not engaged any external agencies to undertake student recruitment on its behalf. Candidates interested in our graduate programmes are advised to apply directly to the University and not through any agents. Candidates who apply through agents will not have any added advantage in gaining admission and the University reserves the right to reject such applications without giving reasons.*

Career Pathways

Find your fit with new opened doors

There are opportunities in Singapore for most areas of IT. What you learn in terms of IT skills is not as important as what you do with it. It is the attitude and the ability to learn from mistakes, and to contribute back to the company that you work for that is likely to make more of a difference than specific IT skills.

There are two main paths for advancement in IT - either technical or management. Technical means you continue to deepen your technical area in a domain (such as system architecture, or software engineering, etc.) and you become an expert in those areas. The other is management, where you can focus on project management, outsourcing, etc.

Our internship companies often tell us that if we can give them good students as interns, it is very likely they will get a job offer at the end of the internship.

As an MTech SE graduate, you will be equipped with the essential knowledge and practical experience to architect, design, build and manage the delivery of robust software systems for organisations.

Career Prospects

- Software Architect (general, smart systems, data)
- Senior Software Engineer
- Data Architect
- Product Manager

MTech alumni are pursuing their careers at these global organisations:

- Accenture
- Creative Technology
- DBS Bank
- Defence Science & Technology Agency
- Deutsche Bank AG
- Fuji Xerox Asia Pacific
- HP Singapore
- IBM Singapore
- Infocomm Development Authority of Singapore
- Inland Revenue Authority of Singapore
- Jurong Port
- Microsoft
- Murex
- NCS
- NEC Asia Pacific
- OCBC Bank
- Revolution Analytics
- Singapore Telecommunications
- Standard Chartered Bank
- Starhub
- ST Electronics
- Tata Consultancy Services

The NUS-ISS Career Services Office helps students to match jobs based on their skills and experience. There will be bi-yearly Career Fairs held for students and graduates to network with employers. However, successful employment will depend on the employers.

The average starting salary of an IT professional depends on the degree and your previous working experience. For fresh graduates with no work experience, the starting salary ranges from S$3,600 to S$3,800. Graduates with more than 3 years of work experience can expect a starting pay of S$4,000 and above.

The most important skill is to get the job done and be persistent. You need to be broad-based and the technology does not matter.

You can get some salary benchmarks from these sites:

- Salary.sg
- Hays.com Salary Guide
- Kelly Services Salary Guide

Robin Cher, Singapore

API EngineerGovTech

Master of Technology in Software Engineering, Class of

"*My biggest takeaway from the MTech SE programme was ge other domains like IT Law, Service Innovation and Business P Management. It allowed me to gain a wider view on the tech ir various facets are interlinked. I also managed to pick up new fi programming skills through my final year project!*"

Priyanshu Kumar Jha, India

Software Development EngineerMicrosoft USA

Master of Technology in Software Engineering (MTech S

"*ISS offers a Master of Technology programme that promises internship programme, advanced electives and innovative subj programme carries a perfect mix that is not offered anywhere*

Nicholas Koh, Singapore

Software EngineerST Electronics (Info-Soft Pte Ltd)

Master of Technology in Software Engineering (MTech S

"*The Master of Technology in Software Engineering programm to deepen my insights into the engineering field and apply the to my current work. Since graduating, my role has been exten manager, where I oversee the testing process. The programm very well for the industry needs.*"

Andrew Chong, Singapore

Senior Software EngineerDSO National Laboratories

Master of Technology in Software Engineering, Class of

"*The MTech SE programme is different from other programme focuses on real world working experiences and project deliver academia and examinations. Graduating from this programme expand my career options and I am in a better position to take responsibilities and value-add to my organisation.*"

Robin Cher, Singapore

API EngineerGovTech

Master of Technology in Software Engineering, Class of

"*My biggest takeaway from the MTech SE programme was ge*
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programming skills through my final year project!"

Priyanshu Kumar Jha, India

Software Development EngineerMicrosoft USA

Master of Technology in Software Engineering (MTech S

"*ISS offers a Master of Technology programme that promises*
internship programme, advanced electives and innovative sub
programme carries a perfect mix that is not offered anywhere

Discover Life with Us

Our Students

Building up a portfolio for work and life.

Find Out More

Internship & Placements

Get a headstart with actual work experience under your belt.

Find Out More

Career Services

Receive job placement opportunities with partner organisations.

Find Out More

Teaching Staff

Learn from our teaching staff with more than 20 years of industry experience.

Find Out More

More than one Google Analytics scripts are registered. Please verify your pages and templates.